



**CEDEFOP**

European Centre for the Development  
of Vocational Training



Education and Culture DG  
Lifelong Learning Programme

## Study visit group report

### Group No

<b>Title of the visit</b>	New resources in science teaching: an innovative partnership linking research and education.
<b>Topic</b>	Promoting acquisition of key competences throughout the education and training system
<b>City, country</b>	France
<b>Type of visit</b>	General education
<b>Dates of visit</b>	April, 8-10 <sup>th</sup> , 2014
<b>Group reporter</b>	Collective work

Dear participants,

The purpose of a study visit is to generate an exchange of experience and good practice between the country you visit and the countries you all come from. Thus, participating in a study visit can be an exciting experience and an important learning tool for you.

During the visit you are invited to prepare a group report summarising your discussions and learning. This will help Cedefop disseminate what you have learnt to others, who share your interest but did not participate in this particular study visit.

On the first day of the visit, you are to select a reporter who will be responsible for preparing the final report and submitting it to Cedefop. Everybody should contribute to the report by sharing their views, knowledge, and practices in their respective countries. Please start working on the report from the first day of the visit.

You will, of course, be taking your own notes during presentations and field visits; but the group report should highlight the result of the group's reflections on what was seen and learnt during the entire visit and the different perspectives brought by the different countries and participants. The report should **NOT** read as a travel diary, describing every day and every session or visit.

Cedefop will publish extracts of your reports on its website and make them available to experts in education and vocational training. When writing the report, please keep this readership in mind: make your report clear, interesting, and detailed enough to be useful to colleagues throughout Europe.

By attaching any photos to the report, you agree to Cedefop's right to use them in its publications on study visits and on its website.

Please prepare the report in the working language of the group.  
Please do not include the programme or list of participants.

The reporter should submit the report to Cedefop (studyvisits@cedefop.europa.eu) within ONE month of the visit.

## I FINDINGS

This section summarises the findings of the group while visiting host institutions, discussing issues with the hosts and within the group. You will be reflecting on what you learnt every day. But to put them together and give an overall picture, you need to devote a special session to prepare the final report on the last day of the visit.

In this section, it is important that you describe not only things you learnt about the host country but also what you learnt about the countries represented by group members.

1. One of the objectives of the study visits programme is to exchange examples of good practice among hosts and participants. Cedefop will select well-described projects/programmes/initiatives and disseminate them to former participants and a wider public, including potential partners for future projects. Therefore it is important that you identify and describe all aspects that, in your view, make these projects/programmes/initiatives successful and worth exploring.

Describe each of the good practices you learnt about during the visit (both from the hosts and from one another) indicating the following:

title of the project/programme /initiative	country	name of the institution that implements it (if possible, provide a website)	contact person (if possible) who presented the programme to the group	whom the project/ programme/ initiative addresses	what features of the project/programme/initiative make it an example of good practice
Teaching soil erosion in high school	France	Ifé, INRA <a href="http://eduterre.ens-lyon.fr/eduterre-usages/sol">http://eduterre.ens-lyon.fr/eduterre-usages/sol</a>	Charles Henri Eyraud(IFé), Josée Broussaud (IFé), Jean Baptiste Algayer (Inra)	high school science teachers	Development of scientific materials for teaching soil (components, erosion etc.) at schools (manual for experiments, working methods, website, videos)
Smartphones for education	France	Ifé, INRA and partners <a href="http://acces.ens-lyon.fr/acces/classe/numerique/smartphones/">http://acces.ens-lyon.fr/acces/classe/numerique/smartphones/</a>	Philippe Jeanjacquot (IFé)	high school students	Integrating smartphones in physics education, teaching and learning activities; taking into consideration what the pupils already know and get as information on the Web; using smartphone and applications as a bridge between the available knowledge and theoretical goals in the curriculum
Explorers seeds (Graines d'explorateurs)	France	Ifé, INRA and partners <a href="http://grainesdexplorateurs.ens-lyon.fr/">http://grainesdexplorateurs.ens-lyon.fr/</a>	Sabine Lavorel (IFé)	middle and high schools	Students and their class experiment one year expedition to study biodiversity (small expedition in the close environment) or follow an international expedition; it is followed by a national science conference linked to other countries via a virtual conference, it is cross-curricular, involves collaboration, professional development of teachers

C-Genial	France	Académie de Versailles, INRA <a href="http://www.science.salecole.org/concours-nationaux/cgenial2013">http://www.science.salecole.org/concours-nationaux/cgenial2013</a>	Jean-Remy Haselvander (Académie Versailles, INRA) Sebastien Gibrac (Ac. Versailles)	middle and high school students	Cross-curricular, voluntary initiative, children prepare a scientific project in their science club (extra-curricular) and take part in a contest at the end of the year, the winner can take part in a national contest in Paris
Inra-IFé updating curriculum	France	Académie de Versailles, INRA IFé	Hervé Levesque (IFé, Ac. Versailles)	high school teachers	Collaboration between teachers and scientists on different scientific domains for developing didactic activities (plants genomic, wheat and domesticated plants, yeast)
Meteo and CLIMETES	France	Ifé, Meteo France, EPFL	Gérard Vidal (IFé)	teachers - all levels	Collaboration between teachers and scientists through a private social network, MOOC as a tool for teachers teaching, sharing meteorological resources, knowledge and experiences
Inra initiatives	<a href="http://www.carboeurope.org/education/index.php?lang=en">http://www.carboeurope.org/education/index.php?lang=en</a> <a href="http://www6.sophia.inra.fr/jardin_thuret/">http://www6.sophia.inra.fr/jardin_thuret/</a>	INRA, examples from other regional Inra research centres	C. Foucaud (INRA)	teachers and students - all levels	European network Carboschools - Partnerships between climate researchers and secondary school teachers (experiments in schools, cross-curricular, after-school activities, transferring knowledge from labs to classrooms, developing new approaches for teaching special topics)  Villa Thuret - Scientific research centre
OPEDUCA (EU project)	International (NL, CZ and other EU countries)	RCE Rhine-Meuse, Charles University Environment Center, etc.	Dana Kapitulcinova	secondary schools, regional partners (universities, business, municipalities, etc.)	Crossing disciplines, cross-curricular collaboration, various regional actors, mind-map approach to learning

		<a href="http://www.opeduc.a.eu/THE_OPEDUCA_PROJECT.html">http://www.opeduc.a.eu/THE_OPEDUCA_PROJECT.html</a>			
Young researchers' programme for companies	Slovenia	Financer: Agency for technology Practice explained on case of biotech company Educell Ltd. (www.educell.si)	Nevenka Kregar Velikonja	young researchers and companies	engagement of PhD students in a company development programme = employment of young researchers is cofinanced by the Agency. This allows students to get insight into applicative research and development.
Centres for school and outdoor activities	Slovenia	Ministry for education www.csod.si	Nevenka Kregar Velikonja	school children	Centers employ teachers that finished science study (e.g. biology, physics...), that have enough knowledge for appropriate explanation and demonstration of scientific facts. Children spend three weeks during primary school in such centres. This is improving scientific and experimental understanding of pupils via practical approach.

\* You can describe as many good practices as you find necessary. You can add rows to the table.

2. The study visits programme aims to promote and support policy development and cooperation in lifelong learning. That is why it is important to know what you learnt about such policies and their implementation during your visit. You are invited to describe your findings concerning the following:

**2.1 APPROACHES TAKEN BY PARTICIPATING COUNTRIES (BOTH HOST AND PARTICIPANTS') REGARDING THE THEME OF THE VISIT. ARE THERE ANY SIMILAR APPROACHES/MEASURES IN PARTICIPATING COUNTRIES? WHAT ASPECTS ARE SIMILAR AND WHY? WHAT ASPECTS ARE DIFFERENT AND WHY?**

The theme of the visit “New resources in science teaching” was discussed mainly on examples of good practices of the organisers and their partner organisations. Other participants also presented some examples of good practices.

Discussion was considering the basic aims that the teaching is about clarifying things and strengthening people.

Science is taken as an example, where both aims can be combined; via scientific approach of teaching, a deep understanding of natural facts is provided to pupils and students and such understanding is long lasting.

Participants agreed that the “problem oriented scientific” approach during which students are engaged in experimental design, encourage experimental work and interpretation. Both activities participate in learning science method, thus they should be the main concept of science teaching.

The countries that participants come from have some significant differences in the organisation of their education system. These differences appear mainly on primary school level where the pupils are (or not, depending on the country educational system) oriented to general or vocational studies. This precocity in the pupil orientation has an impact on further possibilities for a child to pursue his (her) education at university level. However this is not directly influencing the science teaching on different levels of education.

The major similarity between the different countries concerned with the science teaching method, is mainly based on vertical transfer of knowledge (i.e. from universities to secondary and primary schools) and project. This means that it is based on some temporary funding or voluntary engagement of individuals (teachers, school leaders, scientists etc.).

There are also some permanent ways of teaching science on primary school level like houses of experiments or Centres for school and outdoor education (SI).

Another generally observed problem was the weakness or even the lack of support by adequate structures / funding / resources within scientific institutions.

In France, Netherlands and most of other countries one observed a significant lack of interest for science studies. Netherlands: gender

problem: low no. of girls in science studies (this is not the case in eastern EU countries)

The observed differences were mainly in at what age the children are starting to be in touch with scientific approaches and materials. Denmark for example has scientific approach (hands on work) already in primary schools (a part of the curriculum), while in France and other participating countries, this is more project based and “teacher based”.

## **2.2 CHALLENGES FACED BY PARTICIPATING COUNTRIES (INCLUDING HOST) IN THEIR EFFORTS TO IMPLEMENT POLICIES RELATED TO THE THEME OF THE VISIT. WHAT ARE THE CHALLENGES? ARE THEY COMMON CHALLENGES? IF SO, WHY? IF NOT, WHY NOT?**

Participants saw as a major challenge the way of transferring science teaching from the project concept to general curricula and everyday school life. On the project level, usually there is a lot of energy engaged. However, this energy is not always repaid (from the aspect of society) when the sustainability of such activities is not provided. This is the challenge that should be supported by financing systems/structures/operators that promote the activities for science teaching. A shift in understanding of science teaching should be made by teachers to make the science teaching sustainable.

The national institutes and institutions are offering opportunities for science teaching and learning in all countries of the participants. However there is some limitation (financial resources for schools, ambition of the teachers and principals...) to organise science teaching and attract students to collaborate in project work.

Teachers are often stuck with the classic teaching process which is more predictable and easier to plan. Additional knowledge should be provided to them so that they feel more comfortable in implementing scientific contents in their teaching process.

Bridging projects among different levels of education is an enormous unexplored opportunity. A case of good practice was presented from Netherlands, where sciences students are engaged as PAL's that spend a couple of hours per week assisting teachers in secondary schools. This already resulted in increasing the number of students who decide for becoming a science teacher.

Obviously, there are different needs for different societies regarding student populations engaged in science. A couple of good politically supported practices were recognised in the Netherlands where few years ago there was significant lack of students in science. These practices (already mentioned) included: reinforced collaboration between universities and secondary schools, initiatives for more girls in science, renewal of the curriculum on secondary schools with interdisciplinary subjects.

An example of good practice in most European countries on the university and postgraduate level are national programs of financing young

researchers for their PhD study, which is ensuring really good conditions for the beginning of a scientific career.

**2.3 NAME AND DESCRIBE EFFECTIVE AND INNOVATIVE SOLUTIONS YOU HAVE IDENTIFIED THAT PARTICIPATING COUNTRIES (BOTH HOST AND PARTICIPANTS) APPLY TO ADDRESS THE CHALLENGES MENTIONED IN QUESTION 2.2. PLEASE MENTION SPECIFIC COUNTRY EXAMPLES.**

FR:

- Formation of network of different scientific and educational institutions with Research institutes (example of INRA)
- Use of information technologies like internet, social networks, smartphones for teaching scientific contents
- Technology for sharing and disseminating new resources (e.g. MOOC - massive online open course, e-textbook, cross-media) were presented

NL:

A good example of collaboration between universities and secondary schools driven by universities in response to a lack of students in science in the Netherlands: network of 4 universities, 35 secondary schools and business practice: sharing knowledge and experience according to needs of the teachers (bottom up approach) >> win win situation >> resulting in sustainable collaboration. Schools pay for the network 2000 EUR/year + participation fee for special courses. Important is sustainable commitment to the initiative.

Results of this initiative are:

- making a sustainable network with competent stakeholders
- engaging students as a bridge between secondary education and university
- design a curriculum with learning on the site and learning in practise

The participants recognised the importance of engagement of enterprises in science teaching programs (examples are engagement of companies in network presented from NL, participation of companies in education and training of young researchers).

The other important private initiative is an ingenious network of private companies, which are concerned about schools and teaching teachers to improve quality of students' knowledge. Meteo France (presented at the study visit) is another example of company implication in education.

**2.4 ASSESSMENT OF THE TRANSFERABILITY OF POLICIES AND PRACTICES. COULD ANY EXAMPLES OF GOOD PRACTICE PRESENTED IN THIS REPORT BE APPLIED AND TRANSFERRED TO OTHER COUNTRIES? IF SO, WHY? IF NOT, WHY NOT?**

The participants are in position to share good practices and are willing to establish connections between existing projects.

We encourage the Erasmus+ and other European funding initiatives to consider teaching science connections and teachers teaching needs as a prerequisite for efficient science learning process at all levels of education.

Networking initiatives on EU level should be integrated into common concepts of education and by this reach sustainability of those initiatives.

E-learning modules are a way to transfer information and good practices across borders.

### 3. Creating networks of experts, building partnerships for future projects is another important objective of the study visit programme.

Please state whether and which ideas for future cooperation have evolved during meetings and discussions.

The participants are in position to share good practices and are willing to establish connection between existing projects.

# TO SUM UP

## 4. What is the most interesting/useful information that the group believes should be communicated to others? To whom, do you think, this information will be of most interest?

The main areas that participants want to point out for increasing the quality of science teaching in schools:

- ‘hands on’ projects: problem oriented scientific approach where students are engaged in experimental design, work and interpretation should be the main concept of science teaching
- importance of attracting pupils and students with tools and subjects that are close to them (e.g. smartphones)
- training teachers and improve their access to science and appropriate methods is the way to bring science teaching into everyday education, especially current research data.
- focus on equal access to science education according to gender
- the need for sustainability: started initiatives based on networking of different levels of education, and other stakeholders (companies, agencies, societies...) should be implemented and institutionalised.

These are improvements proposed to be considered by policy makers of organisation of the educational systems.

## II Organisation of the visit

This part of the report will not be published but it will be made available to the organisers and will be used by national agencies and Cedefop to monitor and improve implementation of the study visits programme.

We recognise the value of on-going feedback as a way of ensuring that the programme is at all times a responsive and dynamic initiative, meeting the needs of its various participants and target audiences. In this section you are invited to give us your feedback on several factors that, in our opinion, contribute to an effective visit.

### 1. Discuss within the group and check if you agree or disagree with the following statements. Please mark only one box (☑) that expresses most closely the opinion of the entire group. Please use Question 2 of this section to elaborate on your responses, if needed.

		All agree	Most agree	Most disagree	All disagree	Not applicable
e.g.	The size of the group was good.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.1.	The programme of the visit followed the description in the	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		All agree	Most agree	Most disagree	All disagree	Not applicable
	catalogue.					
1.2.	There was a balance between theoretical and practical sessions.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3.	Presentations and field visits were linked in a coherent and complementary manner.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4.	The topic was presented from the perspectives of the following actors of the education and training system in the host country:					
1.4.1.	government and policy-makers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1.4.2.	social partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1.4.3.	heads of institutions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4.4.	teachers and trainers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4.5.	students/trainees	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4.6.	users of services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1.5.	There was enough time allocated to participants' presentations.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6.	The background documentation on the theme provided before the visit helped to prepare for the visit.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7.	Most of the group received a programme well in advance.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8.	The information provided before the visit about transportation and accommodation was useful.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.9.	The organiser accompanied the group during the entire programme.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10.	The size of the group was appropriate.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.11.	The group comprised a good mixture of participants with diverse professional backgrounds.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.12.	There were enough	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		All agree	Most agree	Most disagree	All disagree	Not applicable
	opportunities for interaction with representatives of the host organisations.					
1.13.	There was enough time allocated for discussion within the group.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.14.	The Cedefop study visits website provided information that helped to prepare for the visit.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. If you have any comments on the items 1.1. - 1.14 above, please write them in the box below.

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### III Summary

1. Having summarised all your reflections and impressions, please indicate how satisfied you are with your participation in the study visit. Indicate the number of participants for each category, e.g.

Very satisfied

Very satisfied  Satisfied  Somewhat satisfied  Not satisfied  Neither satisfied nor dissatisfied

2. What elements and aspects of the study visits do you think could be changed or improved?

The topics would be better discussed if a study visit would be one day longer.

3. If there is anything else you would like to write about that is not included in the above questions, please feel free to write below or attach a separate sheet.

Channels / mechanisms for applications ought to be built into the new application structure.  
 The concept of application for organisation of study visits was much simpler and more motivating to potential organisers and participants than currently proposed organisation of similar events via Erasmus+ programme where individual applications are no longer possible.

# THANK YOU!

Please submit the report to Cedefop ([studyvisits@cedefop.europa.eu](mailto:studyvisits@cedefop.europa.eu)) within one month of the visit.